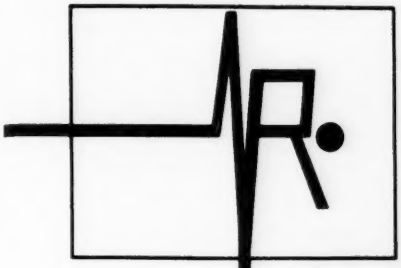

FREE RADICAL BIOLOGY & MEDICINE

The Official Journal of the Oxygen Society

LIST OF CONTENTS,
AUTHOR INDEX, AND KEYWORD INDEX
VOLUME 14, 1993

PERGAMON PRESS
New York ■ Oxford ■ Seoul ■ Tokyo

Free Radical Biology & Medicine

The Official Journal of the Oxygen Society

A Constituent Member of the International Society for Free Radical Research

Co-Editor-in-Chief
Original research, hypothesis papers

Kelvin J. A. Davies
Professor and Chairman, Department of Biochemistry & Molecular Biology
The Albany Medical College
New Scotland Avenue
Albany, NY 12208, USA

Co-Editor-in-Chief
Scientific reviews, survey articles

William A. Pryor
Thomas and David Boyd Professor
Biodynamics Institute
711 Choppin Hall
Louisiana State University
Baton Rouge, LA 70803, USA

International Editorial Board

Bruce N. Ames
University of California, USA

Steven D. Aust
Utah State University, USA

Bernard M. Babior
Research Institute of Scripps Clinic, USA

Adrianne Bendich
Hoffman-La Roche, Inc., USA

Carmia Borek
New England Medical Center, USA

Donald C. Borg
Cook College, Rutgers University, USA

Alberto Boveris
University of Buenos Aires, Argentina

Gregory B. Bulkley
The John Hopkins Hospital, USA

Graham Burton
National Research Council of Canada, Canada

John Butler
Christie Hospital and Holt Radium Institute, UK

Enrique Cadenas
University of Southern California, USA

Edmund S. Copeland
National Institutes of Health, USA

Richard P. Cunningham
State University of New York at Albany, USA

Gideon Czapski
Hebrew University, Israel

Roger T. Dean
Heart Research Institute, Australia

Bruce Demple
Harvard University, USA

Paul W. Doetsch
Emory University, USA

James H. Doroshow
City of Hope National Medical Center, USA

Ingrid Emerit
Universite Pierre et Marie Curie, France

Lars Ernster
University of Stockholm, Sweden

Ronald W. Estabrook
University of Texas, USA

Herman Esterbauer
Universitat Graz, Austria

Robert A. Floyd
Oklahoma Medical Research Foundation, USA

Henry J. Forman
University of Southern California, USA

Bruce A. Freeman
University of Alabama at Birmingham, USA

Irwin Fridovich
Duke University Medical Center, USA

Bernard D. Goldstein
UMDNJ Robert Wood Johnson Medical School, USA

Peter L. Gutierrez
University of Maryland, Cancer Center/Medical School, USA

John M. C. Gutteridge
Royal Brompton National Heart & Lung Hospital, UK

Barry Halliwell
University of California-Davis, Medical Center, USA

Hosni M. Hassan
North Carolina State University, USA

David J. Hearse
Rayne Institute, St. Thomas Hospital, UK

H. A. O. Hill
University of Oxford, UK

Paul Hochstein
University of Southern California, USA

David R. Janero
CIBA-GEIGY Corporation, USA

B. Kalyanaraman
The Medical College of Wisconsin, USA

Manfred L. Karnovsky
Harvard Medical School, USA

Willem H. Koppenol
Louisiana State University, USA

Norman I. Krinsky
Tufts University School of Medicine, USA

William J. Lown
University of Alberta, Canada

Lawrence J. Marnett
Vanderbilt University, USA

Ronald P. Mason
National Institute of Environmental Health Sciences, USA

Joe M. McCord
Webb Waring Lung Institute, USA

Lester Packer
University of California-Berkeley, USA

John E. Repine
Webb Waring Lung Institute, USA

Catherine Rice-Evans
United Medical & Dental Schools of Guy's and St. Thomas's Hospitals, UK

Giuseppe Rotilio
Universita degli Studi di Roma, Italy

Bengt Samuelsson
Karolinska Institute, Sweden

Alex Sevanian
University of Southern California, USA

Helmut Sies
University of Dusseldorf, Germany

Michael G. Simic
University of Maryland, USA

Harold M. Swartz
University of Illinois, USA

Al L. Tappel
University of California-Davis, USA

Daniele Touati
Institut Jacques Monod, France

Fulvio Ursini
University of Padua, Italy

Yu A. Vladimirov
2nd Medical Institute, Russia

Gary Winston
Louisiana State University, USA

Christine Winterbourn
Christchurch Clinical School of Medicine, New Zealand

Journal of Free Radicals in Biology & Medicine (final issue, Volume 2, Number 5/6, 1986) and *Advances in Free Radical Biology and Medicine* (final issue, Volume 2, Number 2, 1986) were merged as of Volume 3, number 1, 1987, of *Free Radical Biology & Medicine.*

Production Editor: Joanne Biles, Pergamon Press, Tarrytown, New York.

Publishing, Advertising, and Subscription Offices: Pergamon Press Inc., 660 White Plains Road, Tarrytown, New York 10591-5153, USA, INTERNET "PPI@PERGAMON.COM"; or, Pergamon Press Ltd., Headington Hill Hall, Oxford OX3 0BW, England.

Published 12 Issues per annum, 2 volumes: *Annual Institutional Subscription Rate* (1993): £420.00 (US$672.00). Sterling prices are definitive. US dollar prices are quoted for convenience only, and are subject to exchange rate fluctuation. Prices include postage and insurance and are subject to change without notice. A subscription to *Free Radical Biology & Medicine* is a benefit to membership of the Oxygen Society. For information about the society, please contact: Ms. Susan Godber, Editorial Assistant, Oxygen Society/Free Radical Biology & Medicine, Biodynamics Institute, 711 Choppin Hall, Louisiana State University, Baton Rouge, Louisiana 70803-1800, USA. Members of the Society for Free Radical Research may order personal subscriptions at a concessional rate; details of this rate are available upon request.

Free Radical Biology & Medicine, Vol. 14, p. III–XVI, 1993
Printed in the USA. All rights reserved.

0891-5849/93 $6.00 + .00
Copyright © 1993 Pergamon Press Ltd.

CONTENTS
VOLUME 14, 1993

Volume 14, Number 1 1993

CONTENTS

Original Contributions

Zhang Zhiyi, Wang Nenghui, Wan Qian, Li Meifan 1 EPR Studies of Singlet Oxygen ($^1O_2$) and Free Radicals ($O_2^{\bullet-}$, $^{\bullet}OH$, $HB^{\bullet-}$) Generated During Photosensitization of Hypocrellin B

M. Bagchi, S. J. Stohs 11 In Vitro Induction of Reactive Oxygen Species by 2,3,7,8-Tetrachlorodibenzo-*P*-Dioxin, Endrin, and Lindane in Rat Peritoneal Macrophages, and Hepatic Mitochondria and Microsomes

Juha Alanko, Asko Riutta, István Mucha, Heikki Vapaatalo, Timo Metsä-Ketelä 19 Modulation of Arachidonic Acid Metabolism by Phenols: Relation to Positions of Hydroxyl Groups and Peroxyl Radical Scavenging Properties

Arthur L. Sagone, Jr., Rose Marie Husney, W. Bruce Davis 27 Biotransformation of Para-aminobenzoic Acid and Salicylic Acid by PMN

Masaru Sagai, Hiroki Saito, Takamichi Ichinose, Masahiko Kodama, Yoki Mori 37 Biological Effects of Diesel Exhaust Particles. I. In Vitro Production of Superoxide and In Vivo Toxicity in Mouse

Garry R. Buettner, Beth Anne Jurkiewicz 49 Ascorbate Free Radical as a Marker of Oxidative Stress: An EPR Study

Katherine A. Sukalski, Karen A. Pinto, Joan L. Berntson 57 Decreased Susceptibility of Liver Mitochondria from Diabetic Rats to Oxidative Damage and Associated Increase in α-Tocopherol

Review Articles

Masafumi Kuzuya, Fumio Kuzuya 67 Probucol as an Antioxidant and Antiatherogenic Drug

John C. Carlson, Xiu Mei Wu, Masaaki Sawada 79 Oxygen Radicals and the Control of Ovarian Corpus Luteum Function

Hypothesis Papers

Christine C. Winterbourn 85 Superoxide as an Intracellular Radical Sink

W. H. Koppenol 91 A Thermodynamic Appraisal of the Radical Sink Hypothesis

Letters to the Editor

S. Samman 95 Dietary Versus Cellular Zinc: The Antioxidant Paradox

Georg F. Weber
Hans-Peter Bruch 96 Hydroxyethyl Starch and Diseases Mediated by Free Radicals

Book Review

William A. Pryor 99 *Vitamin C: Its Chemistry and Biochemistry,* by M. B. Davies, J. Austin, and D. A. Partridge

101 Announcements & Calendar

I Oxygen Society News

Volume 14, Number 2 1993

CONTENTS

Original Contributions

Jolanda Van der Zee
Bellona B. H. Krootjes
Colin F. Chignell
Tom M. A. R. Dubbelman
John Van Steveninck 105 Hydroxyl Radical Generation by a Light-Dependent Fenton Reaction

Julie A. Krsek-Staples
Robert O. Webster 115 Ceruloplasmin Inhibits Carbonyl Formation in Endogenous Cell Proteins

Evgeni A. Konorev
John E. Baker
Joy Joseph
B. Kalyanaraman 127 Vasodilatory and Toxic Effects of Spin Traps on Aerobic Cardiac Function

Salil K. Das
Joseph E. Hinds
Robert E. Hardy
Jerry C. Collins
Shyamali Mukherjee 139 Effects of Physical Stress on Peroxide Scavengers in Normal and Sickle Cell Trait Erythrocytes

M. Bagchi
E. A. Hassoun
D. Bagchi
S. J. Stohs 149 Production of Reactive Oxygen Species by Peritoneal Macrophages and Hepatic Mitochondria and Microsomes from Endrin-Treated Rats

Eve de Lamirande
Claude Gagnon 157 Human Sperm Hyperactivation and Capacitation as Parts of an Oxidative Process

Björn E. Svensson
Astrid Gräslund
Gunnel Ström
Peter Moldeus 167 Thiols as Peroxidase Substrates

T. Kristiina Aalto
Kari O. Raivio 177 Mechanisms of Adenine Nucleotide Depletion from Endothelial Cells Exposed to Reactive Oxygen Metabolites

Kurt Karlsson
Jan Sandström
Anders Edlund
Thomas Edlund
Stefan L. Marklund 185 Pharmacokinetics of Extracellular-Superoxide Dismutase in the Vascular System

Lucia Satiko Yoshida, Teruo Miyazawa, Ichiro Hatayama, Kiyomi Sato, Kenshiro Fujimoto, Takashi Kaneda 191 Phosphatidylcholine Peroxidation and Liver Cancer in Mice Fed a Choline-Deficient Diet with Ethionine

Willisa Liou, Ling-Yi Chang, Hans J. Geuze, Ger J. Strous, James D. Crapo, Jan W. Slot 201 Distribution of Cu Zn Superoxide Dismutase in Rat Liver

Zhenjun Diwu, J. William Lown 209 Photosensitization with Anticancer Agents 17. EPR Studies of Photodynamic Action of Hypericin: Formation of Semiquinone Radical and Activated Oxygen Species on Illumination

Brief Communication

Peter C. Panus, Rafael Radi, Phillip H. Chumley, Robert H. Lillard, Bruce A. Freeman 217 Detection of H_2O_2 Release from Vascular Endothelial Cells

Letters to the Editors

Michael J. Kelner 225 Thioureas and Thioamides React with Superoxide to Form a Novel Product

Edward J. Lesnefsky 226 Reply to Dr. Michael J. Kelner

Book Review

William A. Pryor 227 *Molecular Biology of Free Radical Scavenging Systems,* edited by John G. Scandalios

229 Announcements & Calendar

I Oxygen Society News

Volume 14, Number 3 1993

CONTENTS

Original Contributions

Sarah S. Lloyd, Albert K. Chang, Fletcher B. Taylor, Jr., Edward G. Janzen, Paul B. McCay 233 Free Radicals and Septic Shock in Primates: The Role of Tumor Necrosis Factor

Hung-Yuan Cheng, Tane Liu, Giora Feuerstein, Frank C. Barone 243 Distribution of Spin-Trapping Compounds in Rat Blood and Brain: In Vivo Microdialysis Determination

Peter G. Geiger Fubao Lin Albert W. Girotti	251	Selenoperoxidase-Mediated Cytoprotection Against the Damaging Effects of *tert*-Butyl Hydroperoxide on Leukemia Cells
Marco A. Cacciuttolo Loc Trinh Janice A. Lumpkin Govind Rao	267	Hyperoxia Induces DNA Damage in Mammalian Cells
Xiao-Ying Li Jian-Zhong Sun Silvia Bradamante Francesco Piccinini Roberto Bolli	277	Effects of the Spin Trap α-Phenyl *N-tert*-Butyl Nitrone on Myocardial Function and Flow: A Dose-Response Study in the Open-Chest Dog and in the Isolated Rat Heart
Wilhelm Hansberg Herbert de Groot Helmut Sies	287	Reactive Oxygen Species Associated with Cell Differentiation in *Neurospora crassa*
B. C. Yang F. A. Nicolini W. W. Nichols J. L. Mehta	295	Decreased Endothelium-Dependent Vascular Relaxation Following Subtotal Coronary Artery Occlusion in Dogs
Guohua Cao Helaine M. Alessio Richard G. Cutler	303	Oxygen-Radical Absorbance Capacity Assay for Antioxidants
		Review Articles
Helmut Sies	313	Ebselen, A Selenoorganic Compound as Glutathione Peroxidase Mimic
Masao Sato Ian Bremner	325	Oxygen Free Radicals and Metallothionein
		Brief Communication
Karsten Mäder Reinhard Stösser Hans-Hubert Borchert	339	Detection of Free Radicals in Living Mice After Inhalation of DTBN by X-Band ESR
		Letters to the Editors
Edward J. Lesnefsky	343	Inability of Dimethylthiourea to Limit Tissue Necrosis During Acute Myocardial Infarction
J. G. Kingma, Jr. D. M. Yellon	344	Reply to Dr. Edward J. Lesnefsky
	347	Announcements & Calendar
	I	Oxygen Society News

Volume 14, Number 4 1993

CONTENTS

Original Contributions

Seymour J. Klebanoff 351 Reactive Nitrogen Intermediates and Antimicrobial Activity: Role of Nitrite

Arpad Tosaki, Marie-Therese Droy-Lefaix, Tibor Pali, Dipak K. Das 361 Effects of SOD, Catalase, and a Novel Antiarrhythmic Drug, EGB 761, on Reperfusion-Induced Arrhythmias in Isolated Rat Hearts

Katherine L. Moore, Rolf J. Mehlhorn 371 Cytostatic Effects of Horseradish and Thyroid Peroxidase Derived Free Radicals

Takashi Sugihara, Gundu Rao, Robert P. Hebbel 381 Diphenylamine: An Unusual Antioxidant

Chantal Cazevieille, Agnès Muller, Françoise Meynier, Claude Bonne 389 Superoxide and Nitric Oxide Cooperation in Hypoxia/Reoxygenation-Induced Neuron Injury

Carl A. Hubel, Sandra T. Davidge, Margaret K. McLaughlin 397 Lipid Hydroperoxides Potentiate Mesenteric Artery Vasoconstrictor Responses

Janet G. Cornelius, Benjamin G. Luttge, Ammon B. Peck 409 Antioxidant Enzyme Activities in IDD-Prone and IDD-Resistant Mice: A Comparative Study

Anthony J. Tortolani, Saul R. Powell, Vladimír Mišík, William B. Weglicki, Gustave J. Pogo, Jay H. Kramer 421 Detection of Alkoxyl and Carbon-Centered Free Radicals in Coronary Sinus Blood from Patients Undergoing Elective Cardioplegia

Donald D. Gibson, Daniel J. Brackett, Ronald A. Squires, Andre K. Balla, Megan R. Lerner, Paul B. McCay, Larry R. Pennington 427 Evidence that the Large Loss of Glutathione Observed in Ischemia/Reperfusion of the Small Intestine Is Not Due to Oxidation to Glutathione Disulfide

Review Article

Garry G. Duthie, John R. Arthur 435 Free Radicals and Calcium Homeostasis: Relevance to Malignant Hyperthermia?

Brief Communication

Frank J. Kelly, Simon Birch 443 Ozone Exposure Inhibits Cardiac Protein Synthesis in the Mouse

Letter to the Editors

Wendy Jessup, Roger T. Dean 447 The Antioxidant Properties of an Inhibitor of Nitric Oxide Synthase

Book Review

Timothy W. Robison 449 *Inositol Phosphates and Calcium Signaling,* edited by James W. Putney, Jr.; and *Advances in Second Messenger and Phosphoprotein Research,* Volume 26, edited by Paul Greengard and G. Alan Robison

451 Erratum

453 Announcements & Calendar

I Oxygen Society News

Volume 14, Number 5 1993

CONTENTS

William A. Pryor, Kelvin J. A. Davies vii The Radical View

Original Contributions

Jarmo K. Laihia, Christer T. Jansén, Markku Ahotupa 457 Lucigenin and Linoleate Enhanced Chemiluminescent Assay for Superoxide Dismutase Activity

Lambert N. Daniel, Yan Mao, Umberto Saffiotti 463 Oxidative DNA Damage by Crystalline Silica

Hao Chen, Lori J. Pellett, Henrik J. Andersen, A. L. Tappel 473 Protection by Vitamin E, Selenium, and β-Carotene Against Oxidative Damage in Rat Liver Slices and Homogenate

Krystyna Frenkel, Jerzy Karkoszka, Eung Kim, Emanuela Taioli 483 Recognition of Oxidized DNA Bases by Sera of Patients with Inflammatory Diseases

Isaac Ginsburg, James Varani 495 Interaction of Viable Group A Streptococci and Hydrogen Peroxide in Killing of Vascular Endothelial Cells

Kentaro Kogure, Kenji Fukuzawa, Hideto Kawano, Hiroshi Terada 501 Spermine Accelerates Iron-Induced Lipid Peroxidation in Mitochondria by Modification of Membrane Surface Charge

Hao Chen, A. L. Tappel, Rowena C. Boyle 509 Oxidation of Heme Proteins as a Measure of Oxidative Damage to Liver Tissue Slices

Najat Rabgaoui, Amal Slaoui-Hasnaoui, Jean Torreilles 519 Boomerang Effect Between [Met]-Enkephalin Derivatives and Human Polymorphonuclear Leukocytes

Joel D. Stenzel, Stephen E. Welty, Arthur E. Benzick, E. O'Brian Smith, Charles V. Smith, Thomas N. Hansen 531 Hyperoxic Lung Injury in Fischer-344 and Sprague-Dawley Rats In Vivo

Zora Djuric, Carleen K. Everett, Domenico A. Luongo 541 Toxicity, Single-Strand Breaks, and 5-Hydroxymethyl-2′-Deoxyuridine Formation in Human Breast Epithelial Cells Treated with Hydrogen Peroxide

Brief Communications

Francisco J. Puertas, Manuel Díaz-Llopis, Enrique Chipont, Joaquín Romá, Ángel Raya, Francisco J. Romero 549 Glutathione System of Human Retina: Enzymatic Conjugation of Lipid Peroxidation Products

Paula Grammas, Guang-Jun Liu, Kevin Wood, Robert A. Floyd 553 Anoxia/Reoxygenation Induces Hydroxyl Free Radical Formation in Brain Microvessels

Eddy M. Massa, Cecilia Giulivi 559 Alkoxyl and Methyl Radical Formation During Cleavage of *tert*-Butyl Hydroperoxide by a Mitochondrial Membrane-Bound, Redox Active Copper Pool: An EPR Study

Book Review

William A. Pryor 567 *Methods in Enzymology,* edited by Lester Packer

569 Announcements & Calendar

I Oxygen Society News

Volume 14, Number 6 1993

CONTENTS

Original Contributions

Hans-Anton Lehr, Eberhard Kress, Michael D. Menger, Hans P. Friedl, Christoph Hübner, Karl E. Arfors, Konrad Messmer 573 Cigarette Smoke Elicits Leukocyte Adhesion to Endothelium in Hamsters: Inhibition by CuZn-SOD

Rajindar S. Sohal	583	Aging, Cytochrome Oxidase Activity, and Hydrogen Peroxide Release by Mitochondria
Marco Soriani **Silvia Mazzuca** **Valentina Quaresima** **Maurizio Minetti**	589	Oxidation of Desferrioxamine to Nitroxide Free Radical by Activated Human Neutrophils
Juan A. Melendez **Corrado Baglioni**	601	Differential Induction and Decay of Manganese Superoxide Dismutase mRNAs
E. Smyk-Randall **O. R. Brown** **A. Wilke** **A. Eisenstark** **D. H. Flint**	609	Near Ultraviolet Light Inactivation of Dihydroxyacid Dehydratase in *Escherichia Coli*
		Review Articles
Bernhard F. Becker	615	Towards the Physiological Function of Uric Acid
Stephen C. Bondy **Carl P. LeBel**	633	The Relationship Between Excitotoxicity and Oxidative Stress in the Central Nervous System
		Brief Communications
Paul A. Sobotka **Michael D. Brottman** **Ze'ev Weitz** **Alan J. Birnbaum** **John L. Skosey** **Edwin J. Zarling**	643	Elevated Breath Pentane in Heart Failure Reduced by Free Radical Scavenger
Mukesh K. Sharma **Garry R. Buettner**	649	Interaction of Vitamin C and Vitamin E During Free Radical Stress in Plasma: An ESR Study
J. P. Teare **S. M. Greenfield** **J. S. Marway** **V. R. Preedy** **N. A. Punchard** **T. J. Peters** **R. P. H. Thompson**	655	Effect of Thyroidectomy and Adrenalectomy on Changes in Liver Glutathione and Malonaldehyde Levels After Acute Ethanol Injection
Ingrid Beck-Speier **Johannes G. Liese** **Bernd H. Belohradsky** **John J. Godleski**	661	Sulfite Stimulates NADPH Oxidase of Human Neutrophils to Produce Active Oxygen Radicals via Protein Kinase C and Ca^{2+}/Calmodulin Pathways
Luis A. Videla **Loreto Correa** **Marcela Rivera** **Teresa Sir**	669	Zymosan-Induced Luminol-Amplified Chemiluminescence of Whole Blood Phagocytes in Experimental and Human Hyperthyroidism
Rheal A. Towner **Edward G. Janzen** **Yong-Kang Zhang** **Shigeto Yamashiro**	677	MRI Study of the Inhibitory Effect of New Spin Traps on In Vivo CCl_4-Induced Hepatotoxicity in Rats

Hypothesis Papers

Andrzej J. Olszewski
Kilmer S. McCully 683 Homocysteine Metabolism and the Oxidative Modification of Proteins and Lipids

Dan Torbati
Hussein Wafapoor
Gholam A. Peyman 695 Hyperbaric Oxygen Tolerance in Newborn Mammals—Hypothesis on Mechanisms and Outcome

Book Review

William A. Pryor 705 *Free Radicals and Aging,* edited by Ingrid Emerit and Britton Chance

707 Announcements & Calendar

I Volume 14 List of Contents, Author Index, and Keyword Index

XVII Oxygen Society News

AUTHOR INDEX
VOLUME 14, 1993

Aalto, T. K., 177
Ahotupa, M., 457
Alanko, J., 19
Alessio, H. M., 303
Andersen, H. J., 473
Arfors, K. E., 573
Arthur, J. R., 435

Bagchi, D., 149
Bagchi, M., 11, 149
Baglioni, C., 601
Baker, J. E., 127
Balla, A. K., 427
Barone, F. C., 243
Beck-Speier, I., 661
Becker, B. F., 615
Belohradsky, B. H., 661
Benzick, A. E., 531
Berntson, J. L., 57
Birch, S., 443
Birnbaum, A. J., 643
Bolli, R., 277
Bondy, S. C., 633
Bonne, C., 389
Borchert, H.-H., 339
Boyle, R. C., 509
Brackett, D. J., 427
Bradamante, S., 277
Bremner, I., 325
Brottman, M. D., 643
Brown, O. R., 609
Bruch, H.-P., 96
Buettner, G. R., 49, 649

Cacciuttolo, M. A., 267
Cao, G., 303
Carlson, J. C., 79
Cazevielle, C., 389
Chang, A. K., 233
Chang, L.-Y., 201
Chen, H., 473, 509
Cheng, H.-Y., 243
Chignell, C. F., 105
Chipont, E., 549
Chumley, P. H., 217
Collins, J. C., 139
Cornelius, J. G., 409
Correa, L., 669
Crapo, J. D., 201
Cutler, R. G., 303

Daniel, L. N., 463
Das, D. K., 361
Das, S. K., 139
Davidge, S. T., 397
Davies, K. J. A., vii
Davis, W. B., 27
de Groot, H., 287
de Lamirande, E., 157
Dean, R. T., 447
Díaz-Llopis, M., 549
Diwu, Z., 209
Djuric, Z., 541
Droy-Lefaix, M.-T., 361
Dubbelman, T. M. A. R., 105
Duthie, G. G., 435

Edlund, A., 185
Edlund, T., 185
Eisenstark, A., 609
Everett, C. K., 541

Feuerstein, G., 243
Flint, D. H., 609
Floyd, R. A., 553
Freeman, B. A., 217
Frenkel, K., 483
Friedl, H. P., 573
Fujimoto, K., 191
Fukuzawa, K., 501

Gagnon, C., 157
Geiger, P. G., 251
Geuze, H. J., 201
Gibson, D. D., 427
Ginsburg, I., 495
Girotti, A. W., 251
Giulivi, C., 559
Godleski, J. J., 661
Grammas, P., 553
Gräslund, A., 167
Greenfield, S. M., 655

Hansberg, W., 287
Hansen, T. N., 531
Hardy, R. E., 139
Hassoun, E. A., 149
Hatayama, I., 191
Hebbel, R. P., 381
Hinds, J. E., 139
Hubel, C. A., 397
Hübner, C., 573
Husney, R. M., 27

Ichinose, T., 37

Jansén, C. T., 457
Janzen, E. G., 233, 677
Jessup, W., 447
Joseph, J., 127
Jurkiewicz, B. A., 49

Kalyanaraman, B., 127
Kaneda, T., 191
Karkoszka, J., 483
Karlsson, K., 185
Kawano, H., 501
Kelly, F. J., 443
Kelner, M. J., 225
Kim, E., 483
Kingma, J. G., Jr., 344
Klebanoff, S. J., 351
Kodama, M., 37
Kogure, K., 501
Konorev, E. A., 127
Koppenol, W. H., 91
Kramer, J. H., 421
Kress, E., 573
Krootjes, B. B. H., 105
Krsek-Staples, J. A., 115
Kuzuya, F., 67
Kuzuya, M., 67

Laihia, J. K., 457
LeBel, C. P., 633
Lehr, H.-A., 573
Lerner, M. R., 427
Lesnefsky, E. J., 226, 343
Li, X.-Y., 277
Liese, J. G., 661
Lillard, R. H., 217
Lin, F., 251
Liou, W., 201
Liu, G.-J., 553
Liu, T., 243
Lloyd, S. S., 233
Lown, J. W., 209
Lumpkin, J. A., 267
Luongo, D. A., 541
Luttge, B. G., 409

Mäder, K., 339
Mao, Y., 463
Marklund, S. L., 185
Marway, J. S., 655
Massa, E. M., 559
Mazzuca, S., 589
McCay, P. B., 233, 427
McCully, K. S., 683
McLaughlin, M. K., 397
Mehlhorn, R. J., 371
Mehta, J. L., 295

Meifan, L., 1
Melendez, J. A., 601
Menger, M. D., 573
Messmer, K., 573
Metsä-Ketelä, T., 19
Meynier, F., 389
Minetti, M., 589
Mišík, V., 421
Miyazawa, T., 191
Moldeus, P., 167
Moore, K. L., 371
Mori, Y., 37
Mucha, I., 19
Mukherjee, S., 139
Muller, A., 389

Nenghui, W., 1
Nichols, W. W., 295
Nicolini, F. A., 295

O'Brien Smith, E., 531
Olszewski, A. J., 683

Pali, T., 361
Panus, P. C., 217
Peck, A. B., 409
Pellett, L. J., 473
Pennington, L. R., 427
Peters, T. J., 655
Peyman, G. A., 695
Piccinini, F., 277
Pinto, K. A., 57
Pogo, G. J., 421
Powell, S. R., 421
Preedy, V. R., 655
Pryor, W. A., vii, 99, 227, 567, 705
Puertas, F. J., 549
Punchard, N. A., 655

Qian, W., 1
Quaresima, V., 589

Rabgaoui, N., 519
Radi, R., 217
Raivio, K. O., 177
Rao, G., 267
Rao, G., 381
Raya, A., 549
Riutta, A., 19
Rivera, M., 669
Robison, T. W., 449
Romá, J., 549
Romero, F. J., 549

Saffiotti, U., 463
Sagai, M., 37
Sagone, A. L., Jr., 27
Saito, H., 37
Samman, S., 95
Sandström, J., 185
Sato, K., 191
Sato, M., 325
Sawada, M., 79
Sharma, M. K., 649
Sies, H., 287, 313
Sir, T., 669
Skosey, J. L., 643
Slaoui-Hasnaoui, A., 519
Slot, J. W., 201
Smith, C. V., 531
Smyk-Randall, E., 609
Sobotka, P. A., 643
Sohal, R. S., 583
Soriani, M., 589
Squires, R. A., 427
Stenzel, J. D., 531
Stohs, S. J., 11, 149
Stösser, R., 339
Ström, G., 167
Strous, G. J., 201
Sugihara, T., 381
Sukalski, K. A., 57
Sun, J.-Z., 277
Svensson, B. E., 167

Taioli, E., 483
Tappel, A. L., 473, 509
Taylor, F. B., Jr., 233
Teare, J. P., 655
Terada, H., 501
Thompson, R. P. H., 655
Torbati, D., 695
Torreilles, J., 519
Tortolani, A. J., 421
Tosaki, A., 361
Towner, R. A., 677
Trinh, L., 267

Van der Zee, J., 105
Van Steveninck, J., 105
Vapaatalo, H., 19
Varani, J., 495
Videla, L. A., 669

Wafapoor, H., 695
Weber, G. F., 96
Webster, R. O., 115
Weglicki, W. B., 421
Weitz, Z., 643
Welty, S. E., 531
Wilke, A., 609
Winterbourn, C. C., 85
Wood, K., 553
Wu, X. M., 79

Yamashiro, S., 677
Yang, B. C., 295
Yellon, D. M., 344
Yoshida, L. S., 191

Zarling, E. J., 643
Zhang, Y.-K., 677
Zhiyi, Z., 1

KEYWORD INDEX
VOLUME 14, 1993

absorbance spectrum, 509
acetylcholine, 295
acrosome reaction, 157
activated granulocytes, 27
active oxygen, 1
ADP, 295, 501
adrenalectomy, 655
aging, 583, 683
alcohol, 655
alkoxyl radicals, 559
allantoin, 615
alpha tocopherol, 57, 191, 303
alpha-phenyl *N-tert*-butyl nitrone, 277
alpha-phenyl-*tert*-butylnitrone, 421
angiotensin converting enzyme, 615
animal model, 573
anoxia/reoxygenation, 553
anti-HMdU Abs, 483
anti-inflammatory drugs, 27, 589
anticancer agents, 209
antimicrobial activity, 351
antioxidant, 49, 67, 303, 313, 643
antioxidant defence, 85, 91
antioxidant enzymes, 57, 409, 541
antioxidants, 287, 549
antioxidized DNA base abs, 483
arrhythmias, 361
ascorbate, 49, 649
ascorbate radical, 49
atherosclerosis, 67, 683
autoimmune diseases, 483

beta-carotene, 303, 473
bilirubin, 303
biotransformation of xenobiotics, 27
brain, 633
brain microvessels, 553
brain penetration, 243
bronchoalveolar lavage fluid, 531

calcium regulation, 435
cancer, 683
carbon tetrachloride, 325, 677
cardiopulmonary bypass, 421
catalase, 11, 201, 361, 409, 609
cationic peptide, 495
cell differentiation, 287
cerebral metabolism, 633
chemiluminescence, 11, 149, 287, 457, 519, 661, 669
CHO cells, 371
choline-deficient mice, 191
chronic granulomatous disease, 661
chronic inflammation, 483
cigarette smoke, 573
congestive heart failure, 643
copper, 559
copper-zinc superoxide dismutase, 201
coronary artery narrowing, 295
coronary endothelium, 615
coronary flow, 127, 277
corpus luteum, 79
corpus luteum regression, 79
cyclooxygenase, 615
cytochrome *c* reduction, 149
cytostatic effect, 371
cytotoxicity, 495

deferoxamine, 463
desferrioxamine, 157, 589
desferrioxamine nitroxide radical, 589
diabetes, 57, 409
diesel exhaust particles (DEP), 37
dihydroxyacid dehydratase, 609
diphenylamine, 381
DNA damage, 267
DNA single-strand breaks, 149
DNA strand breaks, 541
drug therapy, 67
DTBN disposition in mice, 339

ebselen, 251, 313
edema, 443
EGB, 361, 761
electron microscopy, 677
electron paramagnetic resonance, 49, 209
electron paramagnetic resonance spectroscopy, 277
electron spin resonance, 167, 361, 649
electron spin resonance spectroscopy, 233
electron transport, 559
ELISA, 483
endothelial cell damage, 37
endothelial cells, 115, 177, 217, 495
endothelium-derived relaxing factor, 295
endrin, 11, 149
enzyme mimic, 313
eosinophil peroxidase, 167
EPR, 1, 339, 559
escherichia coli, 233
ESR, 339, 371
ESR spectroscopy, 105
excitotoxic amino acids, 389
excitotoxicity, 633
exercise, 139

ferrous ion, 501
Fischer-344 rats, 531
5-hydroxymethyl-2′-deoxyuridine, 541
4-hydroxynonenal, 549
free radical detection in living mice, 339
fungi, 287

G6PD, 139
glutamate, 389
glutathione, 427, 531, 549, 655
glutathione S-transferase, 37
glutathione peroxidase, 37, 251, 313, 409
glutathione radical scavenger, 85, 91
glutathione reductase, 409
group A streptococci, 495
GSH-PX, 139

hamster, 573
heme pigments, 509
heme proteins, 473, 509
hepatocarcinogenesis, 191
hepatotoxicty, 677
HMdU-BSA conjugate, 483
homocysteine, 683
horseradish peroxidase, 167
human breast cells, 541
human neutrophils, 661
human retina, 549
hydrogen peroxide, 217, 351, 371, 397, 463, 495, 541
hydroperoxide, 381, 559
hydroxyethyl starch desferrioxamine, 589
hydroxyl free radicals, 553
hydroxyl radical, 27, 37, 105, 463
hyperbaric oxygenation, 695
hypericin, 209
hyperoxia, 267
hyperthyroidism, 669
hypochlorite, 615
hypochlorous acid, 351, 589
hypocrellin B, 1
hypoxia, 389

in vivo, 339, 677
inhalation of DTBN, 339
insects, 583
intravital microscopy, 573
iodonitrotetrazolium reduction, 149
iron, 105
iron chelators, 105
iron-induced lipid peroxidation, 501
ischemia, 389, 421, 427, 643
isolated rat heart, 127

lactoperoxidase, 167
leukocyte/endothelium interaction, 573
leukocytes, 19
leukotrienes, 19
lindane, 11
linoleic acid, 457
lipid hydroperoxides, 397
lipid peroxidation, 11, 57, 149, 191, 325, 443, 501, 549, 643
lipoprotein, 683
liposomes, 501
liver, 655
liver homogenate, 473
lucigenin, 457
lung edema, 37
lyosomes, 201

macrophage, 11
malignant hyperthermia, 435
malonaldehyde, 655
malondialdehyde, 381
mammalian cells, 267
MCF-7, 541
MCF-10, 541
membrane fluidity, 149
mesenteric arteries, 397
metallothionein, 325
methyl-DMPO, 677
microcirculation, 573
microdialysis, 243
microsomes, 11
microviscosity, 11
mitochondria, 11, 57, 501, 583
mouse glutathione S-transferase M II, 191
MRI, 677
mRNA stability, 601
muscle, 583
myeloperoxidase, 27, 167, 351, 589
myocardial function, 277

NADPH oxidase, 157, 661
near ultraviolet light, 609
nervous system, 633
neurological disease, 633
neuron culture, 389
neutrophil activation, 581
neutrophils, 115, 295, 615
newborn, 695
nitric oxide, 389
nitrite, 351
nitroglycerin, 295
nitrones, 243
nitrous acid, 351
NOD mouse, 409
nucleotide depletion, 177

opioid peptide, 519
oxalate, 615
oxidant, 615
oxidant stress, 609
oxidation, 167, 683
oxidative DNA damage, 541
oxidative damage, 473, 509
oxidative metabolism, 661
oxidative stress, 149, 313, 325, 483, 695
oxidized low-density lipoprotein, 67
oxygen free radicals, 267, 409
oxygen radicals, 115, 185, 303, 609
oxygen tolerance, 695
oxygen toxicity, 531, 695

para-aminobenzoic acid, 27
paraquat, 325
PBN, 243

pentane, 643
peroxidase, 351
peroxidase (horseradish and thyroid), 371
peroxidation, 381
peroxide cytotoxicity, 251
peroxide detoxification, 251
peroxide scavengers, 139
peroxisomes, 201
peroxyl radical, 381
peroxyl radicals, 19
pharmacokinetics, 185
phenols, 19
phenyl-DMPO, 677
phorbol myristate acetate, 11, 519
phosphatidylcholine hydroperoxide, 191
phospholipid hydroperoxide cytoprotection, 313
photochemistry, 105
photosensitization, 1, 209
platelet, 381
pleural effusions, 531
POBN, 243
poly-L-histidine, 495
polymorphonuclear leukocyte, 519
primates, 233
probucol, 67
progesterone secretion, 79
prostaglandins, 19
protein carbonyl groups, 115
protein carbonyls, 443
protein oxidation, 115
protein synthesis, 443

radical scavenger, 325
rat hearts, 361
RBC, 139
reactive nitrogen intermediates, 351
reactive oxygen, 633
reactive oxygen metabolites, 177
reactive oxygen species, 27, 79, 149, 287, 589
reduction potentials, 91
reperfusion, 427
reperfusion injury, 361
respiratory burst, 661
respiratory burst activity, 669
retinopathy of prematurity, 695
ribosomal efficiency, 443

salicylate, 553
salicylic acid, 27
secondary amine, 381
selenium, 251, 473
selenoorganic compounds, 313
semiquinone radical, 209
sepsis, 233
septic shock, 233
sickle cell trait, 139
signal transduction, 661
silica, 463
silicosis, 463
singlet oxygen, 209
6PGD, 139
SLE, 483
small intestine, 427
SOD, 139
spermatozoa, 157
spermine, 501
spin counteraction, 1
spin trapping, 1, 233, 277, 421, 559
spin traps, 127, 677
streptolysin S, 495
submitochondrial particles, 559
sulfate, 683
sulfhydryls, 57
sulfite, 661
superoxide, 37, 209, 389, 463
superoxide anion, 157
superoxide dismutase, 11, 37, 85, 91, 157, 185, 361, 409, 457, 463, 573, 601, 609
superoxide formation in cell, 85, 91
surface charge, 501

TBARS, 381
TCDD, 11
tert-butyl hydroperoxide, 397
thermodynamics, 91
thiols, 167
thioretinaco, 683
thiyl radicals, 167
thrombin, 295
thyroidectomy, 655
tissue culture, 371
tissue distribution, 243
tissue slices, 473, 509
tobacco, 573
tocopherol, 649
toxicity mechanisms, 609
tumor necrosis factor, 233, 601
2,55-trimethylpyrroline-N-oxide, 677
2,5-dihydroxybenzoic acid, 553
2-phenyl-5-5-dimethylpyrroline-N-oxide, 677

ultraviolet radiation, 105
uric acid, 303

vascular endothelium, 397
vascular smooth muscle, 397
vascular wall, 185
vasoconstriction, 397
ventricular function, 127
vitamin C, 303
vitamin E, 325, 473

whole blood phagocytes, 669

xanthine oxidase, 177, 457, 615
xanthine/xanthine oxidase, 157

zinc, 325